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bearing *berzellite*, associated with barite, tephroite, calcite, and hausmannite, in veins and nests in the vicinity of Sjögrufan, Grythyttan parish, Örebro, Sweden. The new mineral, to which the name *pyrrhoarsenite* has been given, has a color resembling that of crocoite. It has a hardness of 4, and is soluble in hydrochloric acid. It possesses the optical properties of berzellite, and a composition as follows:—

$As_2O_5+Sb_2O_5$	MnO	CaO	MgO	SiO_2	H_2O	$Al_2O_3+Fe_2O_3$
58.06	17.96	18.68	3.58	1.02	.85	traces.

which may be represented by the formula $(Ca,Mn.,Mg)_3(As, Sb)_2O_8$.

MISCELLANEOUS.—Cohen[1] has re-investigated the subject of the pleochroic halos (Höfe) in the biotites of granite and gneiss, and is thereby led to the conclusion that they are produced by the accumulation of organic substances in the neighborhood of the inclusions they surround, and are not due to the aggregation of mica molecules richer in iron than those forming the main portion of the mineral in which the halos occur. He finds, contrary to the experience of Lévy,[2] that the halos are not affected by treatment with hydrochloric acid, as they should be if they contain a large proportion of iron, but that they are destroyed by heating to a temperature considerably higher than that which is necessary to obliterate the halos in muscovite and cordierite, in which minerals this phenomena is now generally believed to be due in some way to an organic substance.——Franklinite, together with its natural associate, zincite, has been artificially produced by Gorgeu[3] by subjecting to a cherry-red heat an intimate mixture of one part of sodium sulphate, one-half part of zinc sulphate, a quarter to a half part of ferric sulphate, and a little manganese sulphate.[4]

BOTANY.[5]

THE COLLECTION AND STUDY OF CHARACEÆ. — Characeæ are neglected by botanists in general, who seem to have an aversion to all aquatic plants, mainly, it is presumed, from the fact that the collection of aquatics is a specialty. One must go prepared with dredge and rake, with paper and muslin, in order to gather successfully plants of this sort. It has come about that very few bits of Characeæ have been gathered here and there by expeditions and by individuals in America up to recent years; but it is evident that these plants abound in our waters, and that our Chara-flora is varied and strongly characterized. Probably not one-half of the American species have as yet been brought to light, but it is confidently anticipated that a better knowledge of their structure and classification will result in a more widespread interest in them.

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[1] Neues Jahrb. f. Min., etc. 1888. I., p. 165.

[2] Comptes Rendus, xciv., 1882, p. 1196.

[3] Bull. Soc. Franç. d. Min., x., 1887, p. 50.

[4] Cf. American Naturalist, 1887, p. 475.

[5] Edited by Prof. Chas. E. Bessey, Lincoln, Neb.

These plants, often delicate or brittle from an incrustation of lime, are easily destroyed by waves, so that they are rarely found on exposed shores, unless in water deep enough to be beyond the reach of the surface movements. They flourish best in sheltered bays and smaller ponds, especially if a tolerably uniform level of water be maintained. Great changes of level are destructive, alike to species that love the sun and grow in shallow water, and those that hide away in the depths. It is rare, therefore, that Chara-hunting is profitable in ponds or lakes which feed canals or factories. One prefers the land-locked sheets of water fed by springs, especially if there be a sandy bottom. Temperature has but little influence upon them, though the South has its distinctive species, as well as the North. One species, at least, *Chara fragilis*, is universal, found in every country and clime, in ice water at the North, and in the hot springs of the Yellowstone, "hot enough to cook an egg in four minutes."

The best condition of the plant for examination is when it has mature fruit. The time at which this occurs is usually late summer or early fall, though a few species mature early in the spring, and die off in summer. At the South the species are often in good condition the year round, the old fruit holding on, even after new shoots have started from the old nodes.

To gather Characeæ successfully a dredge must be used; for shallow water a small fine-toothed rake is preferred, but for deeper water (one rarely finds them at a greater depth than ten feet) the dredge and line are essential. The best dredge for all purposes is the one recommended by Professor Nordstedt, made as follows: — A disk of lead about three inches in diameter and three-fourths of an inch thick has imbedded in its circumference a row of hooks, about ten in number; through the centre of this disk is passed an iron rod, which projects about three inches below the disk and about nine inches above; to the ring in the upper end toward which the points of the hooks are directed a cord is attached. The dredge weighs about two and a half pounds, and catches all sorts of "weeds" growing on the bottom.

The dissection of these plants is perfectly simple. The delicate species are placed in water until their normal form is restored (if they have been dried), and a portion is put in a "cell" on a glass slide and examined under a two-inch objective; sometimes, but rarely, a higher power is needed for determining fine points, such as the structure of the cortex.

Should the species be incrusted with lime, a piece should be placed in a little strong vinegar till the lime is completely dissolved, then washed in pure water and examined.

Specimens foul with mud must be cleaned in water with a camel's hair brush, but this is liable to detach the globules of fruit, and is only occasionally to be resorted to. Should it be desirable to preserve bits for future reference, they are best mounted in glycerine-jelly, in "cells" deep enough to avoid crushing and shallow enough to permit free examination (flattened brass curtain-rings make excellent cells). When the jelly has dried at the edges, turn on a ring of white zinc cement. — *T. F. Allen, in "The Characeæ of America."*

THE FIBRE OF THE BANANA. — In a report by the United States Consul, L. J. Du Pré, at San Salvador, Central America, the following statement possessing botanical as well as commercial interest occurs: —

"Inquiries made by manufacturers of coffee sacks, and by rope, cordage and paper makers addressed to the consulate are answered by the statement that each banana tree is two and a half to three feet in circumference at its base. Its tapering fibrous body, without a branch, is from ten to fifteen feet in height. These fibres, separated by a thin pith, are of the length of the body of the tree, in which there are no joints. These fibres are used here just as they are taken from the tree and dried, as shoe-strings and as cords for all purposes. The several threads constituting them are of silken fineness, and infinitely separable. The natives use them in making 'bridle-reins' and lariats for most recalcitrant mules. The raw material costs only transportation to the rope-walk Each banana tree bears in the twelve months of its existence only one bunch of fruit, but from two to four or ten trees spring from the roots of the one that has fallen. The bunch of bananas is worth here fifteen cents, and the dead tree nothing. A cordage factory, or paper mill, or coffee-sack maker, were not the defunct banana trees numberless, would give for each dead tree ten times the value of the fruit it produced. Split, dried and packed, the bodies of the banana trees might be shipped profitably to the United States. * * *

"The stem of each banana leaf consists of the toughest and finest threads, and these leaves two and a half to three feet wide, and ten to fifteen feet long, resting on the heads of the native women, are umbrellas in the rainy season in the roofless market places and streets of Salvador. They are the carpets on which they sit, and the beds on which they repose."

GRAY'S CONTRIBUTIONS TO AMERICAN BOTANY. — It is with melancholy interest that we note this last incomplete contribution, the final one of a long series, which appeared in the Proceedings of the American Academy of Arts and Sciences. This was presented by Dr. Sereno Watson, on March 14, 1888, more than a month after the lamented author's death, and is entitled "Notes upon some Polypetalous Genera and Orders." Certain doubtful Rutaceæ are discussed, among them *Xanthoxylum*, to which correct orthography the author calls particular attention.

The notes on Vitaceæ, by way of review of Planchon's "Ampelideæ," he had scarcely commenced "when his work upon the Flora of North America ceased." He pointed out, however, that if we accept Planchon's numerous genera (see AM. NAT. for March), we must take up Rafinesque's name, *Quinaria*, instead of *Parthenocissus* for the Virginia Creeper and its relations. Dr. Gray, however, pronounced emphatically against the innovation, maintaining that "the *Ampelopsis quinquefolia* Michx., remains as the proper representative of the genus, and should preserve the name." Further he says: "It may still be questioned whether the mass of Ampelideæ can be definitely separated from Vitis, and into how many genera divided; but surely *Ampelopsis*, with the Virginia Creeper as the type, must be admitted as a good genus."

A NEW TYPE OF LICHENS. — Formerly it was supposed that all lichens were ascomycetous, and it was quite a shock when a few years ago the announcement was made of the discovery of certain hymenomycetous lichens. We are now told by Massee (Arch. Sci. Phys. and Nat., xviii.,) of a couple of genera of gastromycetous lichens. Thus we have now known the following groups of lichens: (1) Ascolichenes, (2) Hymenolichenes, and (3) Gastrolichenes.

THE ASH OF TILLANDSIA USNEOIDES.—This plant, popularly known as the Florida long-moss, is considered as a typical epiphyte. Reliable observers have stated that it will grow and increase, month by month, on a support as juiceless as a telegraph wire. Its roots are looked upon as mere hold-fasts—anchors, to prevent the plant from falling to the earth. No absorption is supposed to take place through those roots; thus the plant is considered to differ from parasitic species like Phoradendron, etc. Yet it is well known that this so-called epiphyte has a certain proportion of mineral matter in its make-up. At the suggestion of Professor Henry Trimble, I have made an analysis of this ash, and have found the composition of it to be full of interest. If the roots do not absorb the juices of the supporting trees, then this mineral matter found in the plant must be collected from the air. It is hardly to be supposed that the floating dust of the forests where the *Tillandsia* grows is very abundant; and it seems almost absurd to think that all the elements found in the ash can have been collected in this way. The following are the results obtained from about 100 grammes of the dried plant. The moss was in a green condition when received. *Total ash*, 2.95 per cent. Composition:—

Silica	10.300 per cent.
Ferric oxide	2.100 per cent.
Alumina	2.600 per cent.
Oxide of manganese	1.672 per cent.
Lime	12.700 per cent.
Magnesia	11.351 per cent.
Potassa	13.759 per cent.
Soda	14.856 per cent.
Sulphuric acid	7.419 per cent.
Chlorine	6.947 per cent.
Carbonic acid	12.900 per cent.
Phosphoric acid	3.034 per cent.
	99.638

But one other analysis of this ash has been found by me; that of Avequin,[1] in 1835, which is recorded in the following way (in effect, as I have not the exact language at hand):—

1,000 grammes of dry plant gave 32.35 grammes of ash, composed of—

Salts of potash (phosphate, sulphate, carbonate and chloride)	11.47 gr.
Lime (partly as carbonate)	5.96 gr.
Phosphates of lime and magnesia	9.26 gr.
Silica containing a little iron and manganese	5.66 gr.
	32.35

It will be observed that the total ash (3.235 per cent.) is nearly the same as that obtained by me. If the iron and *alumina*, as well as the manganese, in my analysis, are added to the silica, the sum is 16.672 per cent., which is not greatly different from the impure silica of Avequin, 17.186 per cent. It would therefore appear that the plant must uniformly have some such ash as that found above. (Indeed, the ash of any one plant, as is well known does not vary greatly.) What, then, shall we think? That the roots do absorb the characteristic ash-constituents from the trees on which they grow? That would seem to me more rational than to suppose them to be absorbed from the floating matter of the air. But if we do arrive at this conclusion, our idea of the term epiphyte must certainly undergo a radical change.—*T. Chalkley Palmer.*

The Effect on Vegetation of the Variable Rainfall of Northwestern Mexico.[2]—First, want of water. Those who have travelled over the northwestern portion of Mexico will, I think, agree with the writer that it is a dry, barren section, and in want of water. Rains are very uncertain, often years passing without a shower sufficient to cause a good growth of vegetation. When the first white settlers made their homes in this region, over two hundred years ago, they did so during a very dry period of several months, during which they formed the conclusion that the region was one in which it never rained. Their effort, therefore, was to do without rain. The settlements were made near springs or streams, both of which were few, and consequently the settlements limited. During the thirty-two months previous to last August enough rain had not fallen to produce vegetation of sufficient length to be cut for hay. The appearance of the country during the dry season is that of a waste, destitute of food for man or beast, except in favored spots along the creeks and springs; and if nature did not endow some of the plants with power to bloom and mature their fruits during different periods of the year, this desert country would be still more uninviting. The various numbers of the Cactus family produce their showy and attractive flowers during the dry season, these being followed by the sweet, juicy and nutritious fruit, during the hottest part of the year, about the last of June.

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[1] Journal de Pharm. et Chimie [3], xxxv., 95.

[2] Read before the Botanical section of the Biological Society of Washington, March 7, 1888.

There are some forms of the Leguminosræ which also bloom and mature fruit during the dry period when there are no leaves upon them. These plants which bloom and fruit during the dry season, though but a small portion of the whole, contrast very agreeably with the pinched, withered, and resting plants that surround them.

What adds still more to the desert appearance of the country at this season of the year is the character of the soil; the hills and mountains, which are very rocky, have now put on their sombrest, reddish brown, and not a vestige of green is observed upon their surface.

A stranger coming into the country during the dry season would ask the question, "When or how often does it rain?" A botanist desiring to make a collection can only gather the plants that bloom during the dry season, and must wait for the rain in order to complete his collection. One serious effect of the insufficient rains is seen when the shrubs and annuals start into growth after a shower, only to be killed or fail of maturity during the subsequent drought.

The second cause of the scanty vegetation of this region is excess of water. The violent rains and water-spouts which occasionally occur are exceedingly destructive.

In 1717 there was a great rainfall, and those people who had come to the belief that it never rained there, and had only provided themselves with the cheapest and easiest contrivances in which to live, found that it did rain — for forty-six hours it rained so excessively that it destroyed nearly all the food the inhabitants had. The churches and other buildings of the missionaries were leveled to the ground, they being of unburnt brick, while the fields that had been planted, or prepared for planting, were denuded of every plant — natural or cultivated. The rains left in place of the soil so thick a coating of sand and stones that the fields had for the most part to be abandoned and new ones prepared.

Not far from Guaymas is a small village, celebrated for its gardens. A few years ago this place was devastated by heavy rains; many houses were carried away, some gardens greatly injured and others entirely obliterated. Where once there were gardens is now a large area covered with rocks, gravel and sand, resembling a dry river bed. The inhabitants point out to you many localities once fertile, now barren in consequence of excessive rains. Last summer a waterspout fell in the village of Molage in Lower California. The village is built on the brow of a range of low rocky hills, in front of which runs a small stream used to water the gardens upon either side. So sudden and great was the fall of water that before the inhabitants were aware of it the flood was upon them and many houses swept away, the people having barely time to escape with their lives. After the waters had subsided, the valley which had been filled with gardens and green fields presented a rocky waste, as barren as the adjoining hills upon which no rain had this year fallen. While travelling in this part of Mexico last autumn my attention was frequently called to spots injured by the fall of waterspouts. In a country with so little land suitable for cultivation, the loss of however little is severely felt by the inhabitants.

The period which is considered the rainy season lasts from July to December. In one place the rains may commence in one month, in another place some other month, and no two places, however near, are likely to have the same amount. For example, about Guaymas last season the rainy season commenced in the middle of August and ended about the first of October, during which four good rains fell, while at Angel's Bay in Lower California, the first rains were a shower in the early part of November and another about the first of December. After this vegetation quickly sprang up and into bloom, so that at the time of my visit the place looked like spring, while at the same period the vegetation about Guaymas, only two hundred miles distant, had come to maturity.—*Dr. Edward Palmer.*

ZOOLOGY.

KIDNEY IN SEA-URCHINS.—The brothers Sarasin (*Zool. Anzeiger*, 227) claim that the brown structure which surrounds the stone canal of the sea urchins, and to which numberless functions have been ascribed, is in reality a nephridial apparatus. In Asthenosoma this organ rests below on the circumoral blood and water rings, and throughout its extent it forms a large hollow tube. From this cavity are given off numerous large glandular folds, composed of cells which resemble those of renal organs, and notably those of the